

# **Local Hazard Mitigation Plan ANNEX**

## **Bethel Island Municipal Improvement District**

### **Introduction**

Bethel Island is a small community located in the unincorporated territory in the north east corner of Contra Costa County , California. The Bethel Island Municipal Improvement District (BIMID) was created by the California State Legislature in 1960. The Island is not a city and thus has to rely on a combination of private and county public service. BIMID is a special act district, is governed by five elected Directors and has powers similar to a city. BIMID currently provides levee maintenance and repairs, habitat mitigation, park services as well as storm drain maintenance and repair.

Bethel Island is 3516.54 acres of which 100 acres are a mitigation site. Bethel Island is the most populated island in the delta with 2312 residents based on the 2000 census<sup>1</sup>. This is a California Delta island below sea level of -7 to -15 feet, surrounded by 11.5 miles of earthen levee that keeps the Taylor, Piper, Dutch and Sandmound Slough waters out. The Bethel Island levee functions more as a dam than a traditional flood-control levee. Access to Bethel Island is by boat or over one bridge on the south side of the island that connects to a two lane county road.

Funding for the District is ad valorem tax collected by the County most of which is used to compete for State funding from the Department of Water Resources or used as match for other grants. Last year, the District's budget was \$1,098,300. Work is handled by three (3) full time operators, two (2) part time secretaries, seasonal on call workers and private contractors, and a district manager.

### **The Planning Process**

The process of preparing this plan began with the development and adoption of the Bethel Island All Hazard Disaster Preparedness Plan. The Island is included in the Contra Costa County General Plan last updated in 2006.that includes a discussion of fire, earthquake, flooding, and landslide hazards. In addition, the District routinely complies with the California Environmental Quality Act (CEQA) requirements (which, since 1988, have required mitigation for identified natural hazards). The District's efforts have focused on developing an evacuation plan for residents in case of a levee failure, which would inundate the entire island, in addition to identifying other vulnerabilities and ways to militate against them before they strike.

The activities surrounding the creation of the All Hazard Preparedness Plan included continued collaboration with the Office of Emergency Services of Contra Costa County. Contra Costa OES was an ongoing participant in the creation of the ABAG Local Hazard Mitigation plan. The County provided information on facilities including those on Bethel Island that are viewed as "critical" to ABAG.

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<sup>1</sup> For complete Census information on this city, see <http://www.bayareacensus.ca.gov/>.

The Bethel Island Municipal Improvement District Disaster Preparedness Committee, chaired by one of the elected Directors, began meeting in May 2005. Four major objectives were set: (1) Emergency Preparedness Plan, (2) SEMS Training (3) CERT Training and (4) Community Awareness. The committee consisted of District staff, County OES representatives, Fire Department staff, District Engineers and interested citizens. In May 2006 the BIMID Board adopted the Bethel Island All Hazard Disaster Preparedness Plan. The completed document was distributed in December 2006. The ABAG local hazard mitigation plan ANNEX was appeared on the BIMID regular public meeting agenda since October 2006. At a public meeting on February 13, 2007 a presentation was made by the District Engineer regarding the current condition of the levee surrounding the island and the public was invited to comment about their concerns and priorities for levee improvement. The adoption of the Resolution approving the ABAG Report "Taming Natural Disasters" as the District's Local Hazard Mitigation Plan appeared on the March 15, 2007 BIMID General Meeting AGENDA. Copies of the resolution, the draft of this letter (Local Hazard Mitigation Plan ANNEX Bethel Island Municipal Improvement District, and copies of the Mitigation Strategies were available to the public and the BIMID Board of Directors on March 8, 2007. Following a discussion of the agenda item the BIMID Board of Directors unanimously voted to adopt the resolution. No changes were made to the ranking of the Mitigation Strategies.

## **Hazard and Risk Assessment**

The ABAG multi-jurisdictional Local Hazard Mitigation Plan, to which this is an Annex, lists nine hazards that impact the Bay Area, five related to earthquakes (faulting, shaking, earthquake-induced landslides, liquefaction, and tsunamis) and four related to weather (flooding, landslides, wildfires, and drought). These hazards impact this community, except for surface faulting and tsunamis. Surface faulting is not a hazard on Bethel Island because no active faults that would rupture the surface are located on Bethel Island. It is also unlikely that Bethel Island could be struck by a tsunamis because of the island's location within the California Delta at least 69 miles from the Pacific Ocean. Earthquake-induced landslides, and weather related landslides can occur on Bethel Island, but would only occur on the levee (there are no hills on Bethel Island except the surrounding levee).

While the District has identified and used a number of general hazard maps while developing the All Hazard Disaster Preparedness Plan, all of these maps are less detailed and are not as current as those shown on the ABAG website at <http://quake.abag.ca.gov/mitigation/>.

Detailed Engineering reports have been done describing the condition of the levee surrounding Bethel Island. The two latest were prepared by Green Mountain Engineering in 2005 and by Hultgren-Tillis Engineers titled Geotechnical Investigation, Levee Assessment and Conceptual Design Existing Levee Bethel Island, California presented in February 2007.

Bethel Island was reclaimed in 1901. Bethel Island flooded several times in 1907, 1908, 1909 and 1911 and has not flooded since. Information on disasters declared in Contra County can be found at <http://quake.abag.ca.gov/mitigation/disaster-history.html>.

The District examined the hazard exposure of the island from the information on ABAG's website at <http://quake.abag.ca.gov/mitigation/pickdbh2.html>.

- ◆ Earthquake faulting – No active faults run within the district so rupture of a fault is not a direct concern.
- ◆ Earthquake shaking – The island is within category VII Strong potential, in large part because the Greenville fault runs through the city of Antioch approximately 12 miles west of Bethel Island.
- ◆ Earthquake-induced landslides – Sleuthing on the land side or the water side of the levee could occur creating a breach anywhere in the 11.5 miles of levee.
- ◆ Earthquake liquefaction – Liquefaction susceptibility varies along the levee depending upon how much loose sand and sand located below the peat and marsh soils exist. District engineers conclude that a levee breach should be expected if the fill liquefies and that the probability of that happening is high. .
- ◆ Tsunamis – It is unlikely that a Tsunami could reach Bethel Island, approximately 60 miles from the Pacific Ocean and surrounded by narrow sloughs.
- ◆ Flooding – The entire island is within the FEMA flood plane. It is below sea level and can flood from a breach anywhere in the levee. Localized flooding also occurs due to levee seepage and excessive storm runoff. .
- ◆ Landslides – Sloughing of the levee would be the only landslide potential.
- ◆ Wildfires –Although there is no timber on Bethel Island, there are extensive acres of undeveloped grazing land with vegetation that can burn. The danger on Bethel Island is that the ground contains large quantities of peat soil which readily catches fire and then burns underground, making it very difficult to contain and put out.
- ◆ Dam Inundation – Bethel Island is not in danger of Dam Inundation.
- ◆ Drought – The entire island is subject to drought. However, it is entirely surrounded by generally fresh water which can be used in an emergency.

The District also examined the hazard exposure of infrastructure based on the information on ABAG's website at <http://quake.abag.ca.gov/mitigation/pickdbh2.html>. Of the 11.5 miles of levee surrounding the District 8.3 miles of the levee are developed with housing and marinas and 3.2 miles are undeveloped, Bethel Island also had approximately 10 miles of BIMID maintained drainage ditches, that provide critical storm water and seepage control.

- ◆ Earthquake faulting – No active faults run within the district so rupture of a fault is not a direct concern.
- ◆ Earthquake shaking –all 11.5 miles of levee and the 10 miles of drainage ditches are in the very strong category of shaking potential.
- ◆ Earthquake-induced landslides –These would more likely be caused by liquefaction.
- ◆ Earthquake liquefaction –All of the 11.5 miles of levee are vulnerable to liquefaction failure, depending upon the amount of loose sand and other unstable soil base.
- ◆ Tsunamis – Do not present a hazard to Bethel Island.
- ◆ Flooding – In the event of a flood, the entire inside of the island would be filled with water up to the level of high tide. All of the drainage ditches would fill and the drainage pumps could not drain the island.
- ◆ Landslides – Landslides could occur as sloughs on the levee, primarily caused by Earthquake liquefaction.

- ◆ Wildfires –If the peat soil on the island caught fire and burned underground, it is possible for a fire to burn under the levee leading to destabilization and possible collapse. .
- ◆ Dam Inundation – There is no danger of dam inundation on Bethel Island
- ◆ Drought – is not a hazard for levees or drainage ditches.

Finally, the District examined the hazard exposure of critical health care facilities, schools, critical facilities owned by the District and bridges and interchanges, based on the information on ABAG's website at <http://quake.abag.ca.gov/mitigation/pickcrit.html>. There are no critical facilities in the District, with the exception of a county owned bridge that spans Dutch Slough connecting Bethel Island to the mainland.

- ◆ Earthquake faulting – No active faults run within the city so rupture of a fault is not a direct concern.
- ◆ Earthquake shaking –The bridge is in an area with a strong category for Earthquake shaking on the Greenville Fault.
- ◆ Earthquake-induced landslides –This is not an issue because the bridge is not in a landslide area.
- ◆ Earthquake liquefaction—Although the bridge is in an area in danger of liquefaction, bridge support pilings are driven to bed rock to avoid this hazard. The levee supporting entrance to the bridge could be damaged by liquefaction.
- ◆ Tsunamis – Bethel Island does not border the Pacific Ocean or the San Francisco Bay and can not be reached by Tsunamis through the narrow sloughs.
- ◆ Flooding –Although the bridge itself would not be damages by flooding, the ramps to access the bridge would be inaccessible under water and damaged by a flood.
- ◆ Landslides –The bridge is not in a landslide area.
- ◆ Wildfires – The bridge would not be damaged by a wildfire on the island.
- ◆ Dam Inundation – The bridge is not in an area subject to dam inundation.
- ◆ Drought – Drought will not affect the Bethel Island Bridge. The District does not operate a water-supply distribution system.

In spite of the entire areas of the District being located in the flood plane, there are no repetitive loss properties in the District based on the information at <http://quake.abag.ca.gov/mitigation/pickflood.html>.

The District plans to work with ABAG to develop specific information about the kind and level of damage to our levees which might result from any of the hazards previously noted. The District will encourage ABAG to lobby for State bond and proposition money and Federal money to strengthen Bethel Island's levee and bring it up to FEMA HMP Standards.

The District has reviewed the hazards identified and ranked the hazards based on past disasters and expected future impacts. The conclusion is that flooding (levee failure and drainage disruption) and wildfire (an underground peat fire) pose a significant risk for potential loss. In many instances the responsibility rests with Contra Costa County to provide services to support the island infrastructure.

## Mitigation Activities and Priorities

As a participant in the ABAG multi-jurisdictional annexation process, Bethel Island Municipal Improvement District Directions and Staff have reviewed the comprehensive list of mitigation strategies in the overall multi-jurisdictional plan. The tentative decision on priority was made based on a variety of criteria, not simply on an economic cost-benefit analysis. These criteria include being technically and administratively feasible, politically acceptable, legal, economically sound, and not harmful to the environment.

Over time, we are committed to developing better hazard and risk information. We would like to create a disaster-proof region, but a disaster-resistant one is a more achievable goal. Several of the strategies are existing District programs, although most of them are underfunded

These draft priorities have been reviewed by the Directors and the BIMID District Manager. The public has been provided with an opportunity to comment on the District's intent to annex to the ABAG plan since the item has been on the BIMID public hearing agenda repeatedly. The final strategies (as shown in the attached Table) will become an *Implementation Appendix* to the District's All Hazard Disaster Preparedness Plan.

## The Plan Maintenance and Update Process

The District Board of Directors will ensure that **monitoring** of this Annex will occur. The plan will be monitored on an on-going basis. The major disasters affecting our community, legal changes, notices from ABAG as the lead agency in this process, and other triggers will be used. Finally, the Annex will be an agenda item at the monthly Board of Directors public meeting under Committee Reports: Emergency Preparedness Committee. At the meetings, the district directors will focus on **evaluating** the Annex to determine if the plan should be updated in light of technological and/or political changes in the area.

The BIMID Board of Directors is committed to completely reviewing and **updating** this plan annex at least once every five years, as required by the Disaster Mitigation Act of 2000. The District will contact ABAG four years after this plan is approved to ensure that ABAG plans to undertake the plan update process. If so, the District again plans to participate in the multi-jurisdictional plan. If ABAG is unwilling or unable to act as the lead agency in the multi-jurisdictional effort, other agencies will be contacted, including the Contra Costa County's Office of Emergency Services. Counties should then work together to identify another regional forum for developing a multi-jurisdictional plan.

The **public** will continue to be involved whenever the plan is updated and as appropriate during the monitoring and evaluation process. Prior to adoption of updates, the District will provide an opportunity for the public to comment on the updates. A public notice will be posted prior to the meeting to announce the comment period and meeting logistics. The residents of Bethel Island are strong and vocal participants at public meetings related to levee safety and drainage issues.